

## RESIDENTIAL EXPOSURE TO POLYBROMINATED DIPHENYL ETHERS (PBDE) AND RISK OF CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA

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**Background:** Residential dust can be a major source of exposure to PBDEs, which are often found at high levels in U.S. homes, particularly in California. Limited evidence suggests that PBDEs may cause perturbations of the immune system. We estimated the risk of childhood acute lymphoblastic leukemia (ALL) in relation to PBDEs using levels in carpet dust as exposure indicators.

**Methods:** We studied 167 ALL cases 0-7 years of age and 214 birth certificate controls matched on age, sex, and race/ethnicity from the California Childhood Leukemia Study in 2000-2006. We sampled carpets in the room where the child spent the most time using a high volume surface sampler (HVS3), or we took dust from the home vacuum. We measured concentrations (ng/g) of 14 PBDE congeners that we grouped by Penta- (28, 47, 99, 100, 153, 154), Octa- (183, 196, 197, 203) and Deca-BDE (206-209) formulations. Odds ratios (ORs) were calculated using logistic regression adjusting for demographics, year of dust collection, and sampling method.

**Results:** BDE-47, 99, and 209 were the congeners found at the highest concentrations in homes (median [ng/g], interquartile range [IQR]: 1173, IQR 473-2175; 1579, IQR 633-3358; 938, IQR 531-1682, respectively). Comparing the highest to the lowest quartile, we found no association with ALL risk for the sum of BDE congeners in the Penta- (OR=0.7, 95% confidence interval [CI] 0.4-1.3), Octa- (OR=1.0, 95% CI 0.6-1.9), or Deca-formulations (OR=1.0, 95% CI 0.6-1.8). However, comparing homes in the highest tertile to those with no detections, we observed significantly increased risks for BDE196 (OR=2.1, 95% CI 1.1-3.8), 203 (OR=2.0, 95% CI 1.1-3.6), and 207 (OR=2.0, 95% CI 1.0-3.8).

**Conclusion:** We found no association with ALL for most common BDEs in residential dust, but observed positive associations for specific octa- and nona-BDEs. Additional studies with repeated sampling and biological measures will be informative.